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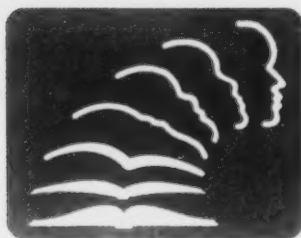
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ABSTRACT

The Institute for the Study of Adult Literacy developed and field-tested a curriculum and instructional materials for teaching occupationally specific vocabulary in the health care field. The materials, which are in the form of a narrative about a woman who learns medical terminology from a friend, were designed to serve as a vehicle for training students to use structural analysis to understand vocabulary relevant to the responsibilities of beginning licensed practical nurses (LPN). Project staff reviewed existing medical vocabulary texts and assembled a list of medical vocabulary word parts that were then each reviewed by three working registered nurses to determine their relevance to a beginning LPN. A pretest/posttest format was used to field-test 11 adult learners at two sites in Pennsylvania. The mean pretest score was 6.91 out of 45 (range, 3 to 15), and the mean posttest score was 39.27 (range, 33 to 44). Both the instructors and adult learners who used the new curriculum and materials reacted positively to them when interviewed. (MN)

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**DEVELOPMENT OF A CURRICULUM AND
MATERIALS FOR USE IN TEACHING
OCCUPATIONALLY SPECIFIC VOCABULARY FOR
HEALTH CARE STUDENTS
FINAL REPORT**

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**DEVELOPMENT OF A CURRICULUM AND
MATERIALS FOR USE IN TEACHING
OCCUPATIONALLY SPECIFIC VOCABULARY FOR
HEALTH CARE STUDENTS
FINAL REPORT**

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Fiscal Year: 1991-1992

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ABSTRACT

The Institute for the Study of Adult Literacy has developed and field tested an innovative curriculum and instructional materials for teaching occupationally specific vocabulary in the health care field. The curriculum and instructional materials train students to use structural analysis to understand the vocabulary a health care worker must read, write, and speak to be successful. The materials are in the form of a narrative about a woman who learns medical terminology from a friend.

The materials were field tested with adult learners at two sites in Pennsylvania. Eleven adult learners completed the materials and took a both a pretest and posttest.

The maximum score possible on the test was 45. The mean score on the pretest was 6.91, with scores ranging from 3 to 15. The mean score on the posttest was 39.27, with a range of from 33 to 44. The scores of the two tests were compared using a correlated t-test, with a result of $t = 34.52$. The probability of this difference occurring by chance is less than .001. Interviews with instructors and adult learners were positive, with all reporting satisfaction with the materials.

While indications from this study are good, an experimental design including a control group using traditional materials is needed to determine the full effectiveness of this new curriculum.

INTRODUCTION

The Institute for the Study of Adult Literacy has developed and field tested an innovative curriculum and instructional materials for teaching occupationally specific vocabulary in the health care field. The curriculum and instructional materials train students to use structural analysis methods to understand the vocabulary a health care worker must read, write, and speak to be successful. The materials are in narrative form, as a story about a woman who learns medical terminology from a friend.

Rationale and Background

For many years, both the federal government and the Commonwealth of Pennsylvania have supported job training programs for individuals who have experienced difficulties finding employment due to lack of education and lack of training in marketable skills. The Comprehensive Education and Training Act (CETA) and the Job Training Partnership Act (JTPA) have funded various training programs. More recently, cooperation among Pennsylvania's Departments of Education, Labor and Industry, and Welfare resulted in Single Point of Contact (SPOC), a program which allows persons receiving public assistance to obtain training necessary for employment. The federal government, with the passage of the Family Support Act of 1988, also recognized the need for support, education, and training for individuals who are now receiving public assistance.

For training to be successful, students must be able to find employment in their chosen job field. It is imperative, therefore, to choose training fields in which job opportunities exist. For a recent project, the Institute for the Study of Adult Literacy identified five

particular job areas to be the fastest growing entry-level fields in Pennsylvania. One of the job areas identified was health care, including nursing assistants, home health aides, geriatric nursing assistants, and licensed practical nurses (Institute for the Study of Adult Literacy, 1990).

Task analyses performed on many job areas clearly show that mastery of vocationally specific vocabulary is necessary for successful job performance. For each job area investigated, the vocabulary differed; a successful student in each area must be able to read and write using a different vocabulary. Teaching occupationally specific vocabulary is especially difficult in the health care field, since it consists mainly of medical terminology not usually found in normal, day-to-day conversations. A successful health care training program must address the problem of teaching difficult occupationally specific vocabulary.

Purposes and Objectives

The purpose of the project was to better prepare individuals for employment by increasing their ability to understand, read, and write occupationally specific vocabulary.

Objective 1: To develop a curriculum and materials which use a structural analysis approach to teaching occupationally specific vocabulary in the health care field.

Objective 2: To train pilot site staff in use of materials.

Objective 3: To implement the use of the curriculum and materials in two sites in Pennsylvania.

Objective 4: To determine if the curriculum and materials are successful in training adult learners in the use of medical terminology.

Objective 5: To disseminate project findings.

Time Frame

This project was funded during the Fiscal Year 1991 - 1992.

July 1 to September 30, 1991

During the first quarter, project staff reviewed medical vocabulary texts and assembled a list of medical vocabulary word parts. Three working registered nurses reviewed each word part and stated whether each was necessary, useful, or not used by beginning licensed practical nurses. The results form the basis of the choice of word parts taught. The project staff wrote the first draft of the pre/posttest and began writing the curriculum materials. Preliminary meetings were held with pilot site staff.

October 1 to December 31, 1991

During the second quarter, project staff completed the curriculum materials.

January 1 to March 31, 1992

Project staff trained pilot site staff during the third quarter. The adult learners took the pretest and began using the materials.

April 1, to June 30, 1992

During the final quarter, adult learners finished the materials and took the posttest. Project staff met with several adult learners and instructors and interviewed them to gauge their perceptions of the materials.

Staff and Other Key Personnel

Project administrator, Dr. Eunice N. Askov, director of the Institute for the Study of Adult Literacy, was responsible for administration of the project. Bernice Sheaffer, project coordinator, was responsible for identifying medical terminology, writing *Mary's Story*, writing the pretest and posttest, training of site instructors, field work, and data analysis. Priscilla Carman, project assistant, wrote the Introduction and Instructor's Manual, developed student activities, and assisted in training of site personnel and field work. Eric Crouch, graduate assistant, was responsible for development of expert review forms and tabulating responses from expert reviewers.

Chris Little of STEP, Inc., Williamsport, PA, and Debra Flaig and Janet Watroba of Appalachian Youth Service, Johnstown, PA, used the developed materials with their SPOC adult learners.

Audience

The target population for which these materials were developed includes adults reading at the mid-literacy level who are participating in employment training programs, preparing for employment in the health care fields, including, but not limited to, licensed practical nurses, nursing assistants, geriatric nursing aides, and home health care aides. The instruction can take place in a vocational training site, such as a vocational-technical school; an adult basic education site, such as one administered by an intermediate unit; or a SPOC training site.

These materials and this final report will be of interest to administrators and instructors in programs serving the target population.

Addresses

Permanent copies of all curriculum materials and the final report will be filed at:

Division of Adult Basic and Literacy Education Programs
 Pennsylvania Department of Education
 333 Market Street
 Harrisburg, PA 17126-0333

and will be available from the Department of Education's adult education resource clearinghouse:

Advance
 Pennsylvania Department of Education
 PDE Resource Center - 11th Floor
 Harrisburg, PA 17126-0333

STATEMENT OF THE PROBLEM

To be successfully employed, adults must receive training in vocational skills, as well as the basic academic skills—reading, writing, mathematics, and problem solving skills—needed on the job. The introduction of vocabulary specific to the job field is an important component of the training.

Nagy (1988) explains that the traditional manner of teaching vocabulary involves two activities: the use of definitions—finding the definition, writing it down, and memorizing—and inferring the meaning of the word from context. Nagy cites several problems with these methods and concludes that a different approach is needed. Medical terminology adapts well to a structural analysis approach to instruction. This approach involves the identification of the word meaning by first identifying the word parts—commonly used suffixes and prefixes, for example. Johnson and Pearson (1984) believe structural analysis to be a “highly important reading skill because though context determines the meaning of a word, it does not always

reveal it." (p. 129) With the use of a structural analysis approach, adult students will not merely memorize individual words, but will learn the skills to determine the words' meanings.

A review of training materials sought to determine if a structural analysis approach for training medical terminology was available. Materials that teach use of word parts—suffixes, prefixes, root words, and compound words—were found. These materials, however, were generic in nature; they did not specifically teach medical terminology. They were also quite elementary (for example P. Bayard, & K. Johnson) Materials which used structural analysis approach to medical terminology were also found, but the instruction was either not extensive (for example, L. Lee, W. Van Dorp, & A. Lyons-Quinn) or were too difficult for the reading level targeted by this project. (See, for example, D. Chabner.)

Beside the use of a structural analytic approach to teaching vocabulary, another approach that has been effective is the narrative. Research has shown that narrative approach has a number of advantages over expository text (Graesser & Long, 1991).

Studies show that narrative text is easier to comprehend and recall than expository text. Scores on recall and comprehension tests are higher for narrative text. Some argue that this is because the content of the narrative may be more familiar to the reader. However, when content is controlled for in the study, narrative text still holds a strong advantage over expository text.

Narrative text depicts events that relate to readers' cultural backgrounds and everyday experiences. This familiarity with everyday

events helps readers build more abstract knowledge in their knowledge structures.

Readers tend to make more knowledge-based inferences with narrative text. That is, they link what is explicitly stated in the text with what they already know about the event sequences that are related in the text. Inference-making is an important part of the process that readers must go through to comprehend text fully.

GOALS AND OBJECTIVES

The goal of the project was to prepare individuals for employment by increasing their ability to understand, read, and write occupationally specific vocabulary.

- Objective 1:** To develop a curriculum and materials which use a structural analysis approach to teaching occupationally specific vocabulary in the health care field.
- Objective 2:** To train pilot site staff in use of materials.
- Objective 3:** To implement the use of the curriculum and materials at two sites in Pennsylvania.
- Objective 4:** To determine if the curriculum and materials are successful in training adult learners in the use of medical terminology.
- Objective 5:** To disseminate project findings.

PROCEDURES

Objective 1: To develop a curriculum and materials which use a structural analysis approach to teaching occupationally specific vocabulary in the health care field.

After reviewing medical terminology texts, project staff soon realized that all medical terminology word parts could not be taught in this curriculum, for there are literally thousands of word parts. Obviously, some word parts are used more often and are, therefore, more important. Three content experts were chosen to determine which word parts were the most important and should be included in the curriculum. The three experts, registered nurses, worked on the floor of a hospital, supervising licensed practical nurses and nursing aides. Each content expert received an extensive list of medical terminology word parts. They received instructions to review the word parts and to decide which word parts were necessary for beginning licensed practical nurses, which were useful, and which were not necessary. The word parts were ordered in importance according to the results of the content experts' responses. The word parts chosen by the content experts were included in the curriculum.

Project staff developed a narrative to teach the word parts, along with an introductory curriculum and learning activities.

Mary's Story

The medical terminology word parts were woven into a story called *Mary's Story*. Mary is a young woman whose husband Mike was recently unemployed. Their family moves to town when Mike finds a job. Mary meets Thelma, a licensed practical nurse, who lives next door. Soon after they meet, Mary's son goes to the hospital with suspected appendicitis. Thelma accompanies Mary to the hospital. Mary becomes intimidated by the medical terminology she hears; she needs Thelma to interpret. Although Mary appreciates Thelma's help, she feels embarrassed that she is not as knowledgeable as her friend

and believes that she does not possess the ability to learn what Thelma knows. Thelma explains that a friend helped her learn medical terminology and so she, in turn, sets out to teach Mary. Mary goes to school and becomes a nurse herself. Throughout the story, Thelma does the teaching. As the story progresses, Mary's self-confidence grows. Thelma also teaches the adult learners in *Mary's Story* and it is hoped, their self-confidence will grow along with Mary's. By the end of the story, Mary is a nurse and she, in turn, helps another young woman.

Introductory Curriculum and Activities

Learners used the introductory curriculum before they read *Mary's Story*. It introduced the structural analysis strategy. In the first activity, students thought about and discussed some of the strategies they used to figure out new words. This is important because many students may not be aware of different strategies and when to use them. The second activity, "Word Trees," introduced the idea that many words are made up of word parts and that word parts can help readers figure out whole words. The third activity gave students practice using structural analysis.

The instruction also raised students' awareness of the English language. Students first thought about words that have recently been introduced into the language; discussion guided students in understanding the cultural influences on language growth. The second part of this section helped students become aware of the growth and changes in medical terminology.

Activities to Accompany Mary's Story

Licensed practical nurse trainees must recognize and use medical terminology in a variety of ways. Trainees must recognize and understand important medical words when they hear them spoken by others and when they see them written in printed materials. They must use the words correctly in conversation and in writing as they communicate with other members of the health care team and with patients. A variety of exercises and activities gave adult learners practice in all of these areas.

1. Reading: Compare and contrast exercises helped adult learners make fine discriminations of the medical terminology in context. Maze activities gave adult learners practice in choosing the correct word to fit the context. Grouping activities helped adult learners look for similarities and differences in medical words that are composed of word parts. Case studies, memos, and reports gave adult learners practice reading printed materials that resemble the kinds of text they may encounter in training programs or in the workplace.

2. Writing: Adult learners practiced writing and spelling the medical words and word parts by keeping notebooks. In cloze activities and crossword puzzles, adult learners supplied the correct word in writing. Writing sample memos or reports gave adult learners practice supplying the correct medical terms in formats that are similar to those they encounter in the workplace. In other writing activities, adult learners supplied the medical word from the parts or supplied the word parts from the whole medical word. Activities such

as these gave adult learners practice working with medical words from part to whole and from whole to part.

3. **Speaking:** Adult learners often read aloud to partners. These activities helped them learn to pronounce the words correctly and to use the words more confidently in conversation.

4. **Listening:** The teacher's guide for *Mary's Story* recommended that the instructor introduce new words and word parts before each lesson. This helped adult learners learn the correct pronunciation of the new words and word parts. In "read-aloud" activities with partners, adult learners were given additional opportunities to hear the medical terms in conversation.

The activities that accompany *Mary's Story* also built other skills. Activities in which adult learners work with peers or in groups, for example, developed their teamwork skills—skills that are essential in the health care field. Other activities encouraged active, creative learning, such as designing a business card or teaching word parts in some creative way to a group. Races to build words with word cards encourage fluency and speed.

Objective 2: To train pilot site staff in use of materials.

Project staff trained pilot site staff at the sites. The training sessions included the following: introduction to functional context literacy; using the structural analysis approach to vocabulary development; and introduction to the new curriculum and materials.

Objective 3: To implement the use of the curriculum and materials at two sites in Pennsylvania.

The two participating sites were STEP, Inc. in Williamsport and Appalachian Youth Service in Johnstown. At STEP, a class in the SPOC

program used the materials. The SPOC participants, working in pairs and teams, used the materials as a full class project. At Appalachian Youth Service, learners were also SPOC participants. At this site, however, materials were used with individuals, not in a full class setting.

Objective 4: To determine if the curriculum and materials are successful in training adult learners in the use of medical terminology.

After the word parts were chosen, project staff randomly sampled the word parts and developed a pretest and posttest. This test included several activities. Learners produced the medical terminology word part for common words (example: learners produced *hyster/o* for the word uterus). Learners were given a definition and produced two medical word parts to form the word defined (example: learners were given the definition "an inflammation of the liver" and produced the word *hepatitis*). Learners were given a medical term to define, using their knowledge of medical terminology word parts (example: *encephalomyelitis* is an inflammation of the brain and spinal cord). Learners matched a word part with its English translation (example: *esthesia* = feeling, sensation). Learners were given a statement containing a word part and answered a question about it (example: "The doctor prescribed an **analgesic**. What will that do?").

All adult learners using the materials were to take a pretest and a posttest to measure increase in their vocabulary. Adult learners took the test before they started the curriculum and after they finished. Learner scores in the pretest were compared to learner scores in the posttest using a t-test for correlated samples.

Project staff interviewed several adult learners and instructors to gauge their personal perceptions of the curriculum. These informal interviews took place at pilot sites.

Objective 5: To disseminate project findings.

Project staff have submitted a proposal to present the materials and results of pilot testing at the Pennsylvania Association of Adult and Continuing Education Midwinter Conference to be held in February 1993.

RESULTS

This section will review the results of the project by objective. Included are descriptions of both the positive results, i.e., those objectives fully met, and the negative results, i.e., those objectives not fully met. The evaluation techniques and instruments are also described in this section.

Objective 1: To develop a curriculum and materials which use a structural analysis approach to teaching occupationally specific vocabulary in the health care field.

All materials were developed as planned. The original plan did not specify the use of narrative approach. After reviewing the literature and discussing the best method of teaching this material, however, project staff decided that this approach would be beneficial to the learner.

Objective 2: To train pilot site staff in use of materials.

In the original plans for the project, training was to be held at Penn State. Difficulties arose, however, in finding a time for the training. The two sites chosen were not ready for the materials at the same time. The instructors were part-time, and would have had to

cancel classes to come to the training. Instead, training took place at the individual pilot sites. Project staff visited the sites and trained instructors. Project staff visited pilot sites during the project and responded to questions by the telephone during the project.

Objective 3: To implement the use of the curriculum and materials at two sites in Pennsylvania.

Two pilot sites with appropriate adult learners used the materials. Adult learners were enrolled in the SPOC program at both sites. Altogether, 11 adult learners completed the program. The project planned to use the materials with more learners, but the number of adult learners training for the health care field at both sites was less than anticipated. Another class was planned at the Williamsport site; the instructor, however, could not fit the materials into her schedule. Five adult learners at both sites started the program, but did not complete it. Each site used the materials differently. In Williamsport, a class of women used the materials together, working in teams and pairs. They received direct instruction from the instructor. In Johnstown, two participants worked on the program more or less independently, with the instructor providing guidance instead of direct instruction.

Objective 4: To determine if the curriculum and materials are successful in training adult learners in the use of medical terminology.

Comparison of Pretest and Posttest

Eleven pairs of pretest and posttest scores were compared. The maximum score possible on the test was 45. The mean score on the pretest was 6.91, with scores ranging from 3 to 15. The standard deviation on pretest scores was 4.32. The mean score on the posttest

was 39.27, with a range of from 33 to 44, and a standard deviation of 3.95. The following chart and table illustrate the differences between the pretest scores and the posttest scores, learner-by-learner.

TABLE I
PRETEST VS POSTTEST

SUBJECT	PRETEST	POSTTEST
1	12	43
2	05	42
3	12	43
4	03	33
5	03	35
6	03	40
7	08	36
8	15	44
9	07	43
10	03	36
11	05	37

Mean of Pretest = 6.91

Standard Deviation of Pretest = 4.32

Mean of Posttest = 39.27

Standard Deviation of Posttest = 3.95

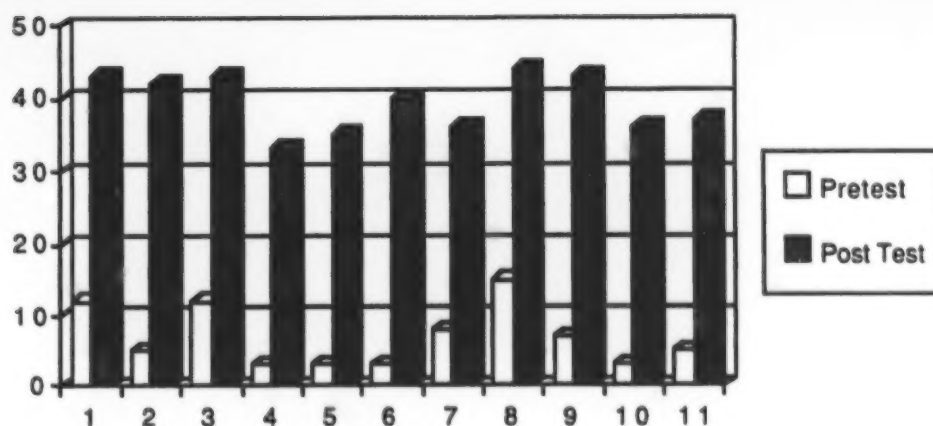


FIGURE I
PRETEST SCORES
VS
POSTTEST SCORES

The scores of the two tests were compared using a correlated t-test, with a result of $t = 34.52$. The probability of this difference occurring by chance is less than .001.

Interviews

Instructors reported that they enjoyed using the curriculum. One instructor explained that after she introduced *Mary's Story* to her adult learners, she told them to read the first chapter. Instead, most of her students read through several chapters. She said her adult learners had fun working together on the activities. Another instructor had recently completed a community college course on medical terminology and began teaching her students using the same

materials she had used. She stated that every time she began to teach the class medical terminology, the class would find something else they had to do. After introducing *Mary's Story* and activities to her students, she had no further difficulty keeping them on track. The third instructor had only one student using the materials. This individual was reading at a level higher than the targeted audience. The instructor stated that, even though her student found the story easy reading, she nevertheless enjoyed reading it and was making progress in learning the medical terminology. Unfortunately, the student did not take the pretest and posttest.

Project staff conducted informal interviews with six adult learners who had completed the curriculum. The interviews were held at Williamsport with four participants, and at Johnstown with two participants.

All participants expressed satisfaction with the materials. In Williamsport participants were excited to be meeting "the people who wrote about Mary."

Mary's Story was presented to adult learners without illustrations; therefore, the readers had to visualize Mary and Thelma themselves. Interviewers asked participants what Mary and Thelma looked like. Each participant described Mary and Thelma differently. Some thought Mary and Thelma were young; some thought Thelma was older. Participants visualized Mary and Thelma as being of different races. In fact, the descriptions of Mary and Thelma differed drastically with the woman describing them. Prior to the interviews, plans had been made to illustrate the story. After talking to the women in the program, project staff decided not to illustrate the

story; instead, the users will be allowed to visualize Mary and Thelma any way they felt most comfortable.

The adult learners spoke of the two characters as if they were friends. One woman said, "I felt that I was learning from Thelma along with Mary." Another woman told the interviewers about a recent experience. She, like Mary, had to take her child to the emergency room. The participant said she felt less afraid and more able to understand what was happening, because it also happened to Mary.

Mary and Thelma were so real to the participants that they believed the two characters were real people. Two interviewers were asked by one adult learner, "Which one of you is Thelma and which one is Mary?"

After a discussion about Mary and Thelma, one interviewee began discussing the idea of women helping other women. They decided it would be a good idea if Mary helped another woman much as Thelma had helped her. Following this idea, the author added a conclusion in which Mary meets another young woman and offers to help her.

Negative Findings

There were no negative findings as such, but questions remain. First, all adult learners at the pilot sites were women. Since no men used the materials, project staff do not know if men would do as well as women. No longitudinal data were collected. Participants took the posttest soon after instruction was complete. We do not know how much knowledge adult learners will retain over time. There were no control groups, so we do not know how much of the learning was due to good instruction. The only indication we have is that two adult

learners in one class had resisted instruction in medical terminology presented in a traditional manner.

Objective 5: To disseminate project findings.

Project staff have submitted a proposal to present findings at the Midwinter Conference of the Pennsylvania Association of Adult and Continuing Education.

CONCLUSIONS AND RECOMMENDATIONS

From the indications of this study, the following conclusions can be made:

- Adult learners using these newly developed materials learned to use structural analysis methods to understand medical terminology.
- Adult learners enjoyed using the materials.
- Instructors enjoyed using the materials.

A full study using quasi-experimental design with a control group is necessary to determine if teaching structural analysis in a narrative format is more effective than the traditional methods of teaching medical vocabulary.

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